

Considerable deficiencies were noted in New England, near the coast to southward of Chesapeake Bay, especially over the Florida Peninsula, from Illinois westward and southwestward to the western borders of Nebraska, Kansas, and Oklahoma; and over most of the Plateau States, California, and western Oregon.

The scanty rainfall in Florida was very unfavorable, as drought prevailed over large portions of the State when the month began. In California the light precipitation during the month in most counties was considered unfortunate in its probable effects on the summer water supply. The central plains also were somewhat adversely affected by the February dryness.

SNOWFALL.

In the Northeast snowfall was not notably heavy, but owing to the low temperatures there was little melting at any time and deep snow cover remained.

About the 13th to 15th rather heavy snow from Minnesota to New York, continued with cold and high winds, caused great interference with traffic, several lives being lost in the North-Central States.

In the southern Middle Atlantic States, near the Ohio River, and especially in Missouri and Kansas there was decidedly little snow during February, and in Missouri and Kansas and near-by States the snowfall of the entire winter was the least of record.

Early in the month considerable snow for the latitude occurred from south-central Oklahoma to eastern Tennessee and the districts adjacent.

In the western half of the country the most notable snowstorm occurred in Washington and adjacent districts about the 11th to 14th. At lower levels the depths were generally from 12 to 20 inches, and there was much interference with traffic, especially around Spokane where the snow drifted greatly. In the Mountain districts of the far West the February snowfall was nearly everywhere less than normal, notably in Nevada and central and northern California. Somewhat more than normal occurred in Oregon and New Mexico.

The accumulated snowfall in the higher districts is, however, sufficient to promise a moderately good flow of water during the warmer season in all but a few districts.

RELATIVE HUMIDITY.

The relative amount of moisture in the atmosphere during the month was on the whole deficient, although in small areas it was distinctly in excess, among these were areas on the eastern slopes of the Rocky Mountains, from the lower Mississippi Valley westward to Arizona, and along the entire northern border, where there were many localities having percentages well above the normal.

In the middle plains the percentages were usually much less than normal, the deficiencies exceeding 20 per cent in some cases, and similar conditions existed over much of California.

SEVERE LOCAL STORMS, FEBRUARY, 1923.

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau.]

Place.	Date.	Time.	Width of path (yards).	Loss of life.	Value of property destroyed.	Character of storms.	Remarks.	Authority.
Tunica and Tate Counties, Miss.	2					Wind.....	Fifteen persons injured; buildings blown down, and other property losses resulted.	Official, U. S. Weather Bureau.
Spokane, Wash.....	12					Blizzard.....	Street car service hampered; business interfered with. No other damage reported.	Do.
Independence, Calif., and vicinity	12					High winds.....	Much damage to ranch houses, power lines, and telegraph poles.	Do.
Michigan, Minnesota, and Wisconsin.	13-14					Cold waves and blizzards.	Traffic demoralized; some loss of life; much property damage and many cases of frozen hands and feet. Complete suspension of train service in western Minnesota.	Do. Do.
Bismarck, N. Dak.....	13-14					Blizzard.....	Train service interrupted; some branch lines not in operation for 7 days.	Do.
Baltimore, Md.....	14					High winds.....	Windows broken; trees uprooted; small house unroofed; telephone and telegraph poles down.	Do.
Seattle and Tacoma, Wash...	14					Snow and ice.....	Wires broken; car service stopped; trains delayed; business interrupted.	Do.
Pittsburgh, Pa.....	14-15					High wind.....	Plate-glass windows and signs damaged; telegraph and telephone poles down; numerous fires caused partly by high winds.	Do.

STORMS AND WEATHER WARNINGS.

WASHINGTON FORECAST DISTRICT.

Storm warnings.—Storm warnings were issued for the Atlantic coast from the Virginia Capes northward on the 2d and 3d in connection with a disturbance of considerable intensity which moved rapidly east-northeastward over the Lake Region and northern New England. However, no winds of verifying velocity were reported.

The next warnings were issued for the coast from Cape Hatteras to Atlantic City at 10 a. m. of the 5th, at which time a disturbance was central over the eastern Gulf of Mexico and a strong high-pressure area was over the Lake Region and the Middle Atlantic States. These warnings were verified.

At 1 p. m. of the 12th pressure was quite high over northern New England and falling very rapidly over the Lake region and the Ohio Valley and southeast storm warnings were ordered displayed from the Virginia Capes to Eastport, Me. Verifying velocities were reached at a number of stations, the highest, 48 miles an hour from the southeast, occurring at Nantucket, Mass.

On the 14th pressure was abnormally high west of the Appalachian Mountains and low over New England, and northwest storm warnings were displayed from Cape Hatteras to Nantucket, Mass. The highest velocities reported were 72 miles an hour at New York City and 60 miles at Block Island, R. I., both from the northwest.

The last storm warnings of the month were ordered displayed at 10 p. m. of the 17th on the Atlantic coast

from Cape Hatteras to Atlantic City. A velocity of 48 miles was reported at Cape Henry, Va.

Cold-wave warnings.—The most important cold-wave warnings of the month were those issued on the 2d–3d and the 13th–14th. On the 2d they were issued for the Ohio Valley and western New York and on the 3d were extended over the remainder of the Washington Forecast District, except portions of the South Atlantic States. These warnings were fully verified, except from the southern portion of eastern Pennsylvania southward. The morning of the 13th cold-wave warnings were ordered for Ohio and western Kentucky, and in the evening were extended eastward to the Appalachian Mountains and southward over western Tennessee. The following morning warnings were issued for Vermont and the extreme northern portion of eastern Pennsylvania. These warnings were fully verified. During the remainder of the month cold-wave warnings were not needed, except for very limited areas on the 9th and 10th.

Frost warnings.—Frost warnings were issued for portions of the South Atlantic and East Gulf States on the following dates: 5th, 6th, 7th, 15th, 16th, 17th, 18th, 19th, 22d, and 23d. The most important were those of the 18th, when heavy to killing frost was predicted for Florida to the 27th parallel and light to heavy frost in the extreme southern portion. These warnings were well verified, as a rule.—*Charles L. Mitchell.*

CHICAGO FORECAST DISTRICT.

The month was cold over most of the forecast district, there being a few small areas, however, in which the temperature was above the normal. The temperature in the Great Lakes region, upper Mississippi and lower Ohio Valleys, and the northern Rocky Mountain district, ranged from 2° to 7° below the normal. Precipitation was deficient, with the exception of the Ohio Valley where a considerable fall occurred.

Two cold waves swept the entire forecast district, one during the first few days in the month and the other about the middle of the month.

The first appeared in northern Alberta on the night of February 1, but the report from Edmonton, the most northerly outpost, which gave evidence of its coming, was received too late. As a consequence of this fact and the rapid movement of the cold wave eastward across Montana and Wyoming, warnings were not issued in advance to those States, with the exception of live-stock warnings for southern Wyoming. Cold-wave warnings were issued, however, on the morning of the 2d for the balance of the trans-upper Mississippi region and extended in the afternoon and night across the Mississippi Valley to the eastern limits of the Chicago Forecast District; and live-stock warnings were extended to Kansas and Nebraska. These advices were fully verified at practically every station.

The second general cold wave appeared in the Canadian Northwest on the morning of the 12th and moved southward and eastward in the wake of a well-marked storm area, the cold in the Northwest steadily increasing in intensity while its influence extended over the entire forecast district by the morning of the 14th. Warnings of this cold wave were sent to every station in the forecast district, with a resulting complete verification. Live-stock warnings were, moreover, issued to the Dakotas, Nebraska, and Wyoming for strong winds, snow, and cold,

and doubtless these were of considerable benefit to stockmen.

Both of these cold waves were brought in by strong winds, the second one reaching gale force quite generally over the North-Central States. Advices were sent to ports on Lake Michigan, which maintain winter navigation, well in advance of these severe winter conditions. No casualties were reported on the lake.

Another cold wave, but not of a general character, pushed down from Manitoba over the northern Plains States and upper Mississippi Valley on the 5th and 6th. Warnings were sent to the various States well in advance of the occurrence of critical temperatures.

From time to time during the month messages were sent to various points in the forecast district, and especially in the northwestern portion, in regard to a prospect for temperature conditions for several days in advance, sometimes for one week; and local interests in Chicago were kept in rather close touch with the weather office during the month in connection with shipments and work of varying character.

The forecasts of the ensuing night minimum temperatures in Chicago are now of the highest importance, and the actual minima during the entire month agreed closely with the predictions, with a few exceptions.—*H. J. Cox.*

NEW ORLEANS FORECAST DISTRICT.

Following the unseasonably warm weather experienced in the three preceding months, comparatively low temperatures prevailed during much of February prior to the 20th.

Cold-wave warnings for the northwestern portion of the district, issued on the night of January 31, were repeated on the morning of February 1 and extended over northern Arkansas, but failed of verification, as the area of high pressure on which they were based diminished in intensity.

An extensive area of high pressure appeared in western Canada on the morning of February 2 and cold-wave warnings were issued for the northern portion of west Texas. On special observations, the warnings were extended over Oklahoma and the northwestern portions of Arkansas and east Texas. Further extensions of the warnings were made, so that by the 3d the entire district was included. This cold wave was the most severe and the most general of the winter in this district; and the warnings, which were timely, were fully verified. It was attended by strong northerly winds to moderate gales on the West Gulf coast, for which warnings were displayed on the Texas coast from 8:30 p. m. of the 2d to 8:30 p. m. of the 4th and on the Louisiana coast from 12:30 p. m. of the 3d to 12:30 p. m. of the 4th. A warning of moderate northerly gales at Tampico, Mexico, was issued on the 3d, at noon.

A warning issued on the morning of the 10th, for a cold wave in the Texas Panhandle, was not verified.

Warnings were issued February 12–14 well in advance of a cold wave which overspread the interior portions of the district. While this cold wave was attended by higher pressure than that of the 3d–6th, the temperature was not generally so low; but the cold weather continued slightly longer.

Northeast storm warnings were ordered displayed on the Texas coast at 1:15 p. m. on the 14th and were justified.—*R. A. Dyke.*